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Ar/1765.

September 18, 2003

To: Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Fr: Stephen B. Ackerman, Reg. No. 37,761  
28 Davis Avenue  
Poughkeepsie, N.Y. 12603

RECEIVED  
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GROUP 1700

Subject:

Serial No.	10/020,754	12/12/01
B. LEE ET AL		
"NEW BURIED STRAP FORMATION METHOD FOR SUB-150 NM BEST DRAM DEVICES"		
Grp. Art Unit: 1765	KIN CHAN CHEN	

## RESPONSE FINAL PATENT OFFICE ACTION

Dear Sir:

In response to the Office Action dated August 6, 2003, please consider the following remarks concerning the above-identified application for patent:

## CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on October 1, 2003.

Rosemary L. S. Pike, Reg. No. 39,332

Signature Rosemary L. S. Pike  
Date Sept. 30, 2003

REMARKS

Examiner K. C. Chen is thanked for the thorough examination and search of the subject Patent Application.

Reconsideration of the rejection under 35 U.S.C. 102 of Claims 1 and 6 as being anticipated by Heo et al is requested in accordance with the following remarks.

It is a key feature of Applicants' invention that the buried strap is formed by a selective silicon deposition process. Claims 1 and 6 claim this selective deposition process, shown in Fig. 6. In the process described in Heo et al with reference to Fig. 1C, the polysilicon layer is deposited on the surface of the pad nitride layer and within the trench 112 where it is polished back by CMP (col. 1, lines 49-54) to form buried strap 122. The Examiner states on page 5 of the office action that this deposition only deposits on specific areas, so it is a "selective" process. Applicants agree that a selective deposition process only deposits on specific areas. This is what is claimed in Applicants' invention and shown in Fig. 6. It is discussed on pages 9-10 of the Specification that in the HSG process, the polysilicon layer will not grow on crystalline silicon, so the silicon nitride liner layer is optional. In other selective deposition processes, a silicon nitride liner layer is mandatory so that the conductive layer does not grow on the uncovered part of the trench.

Heo does not teach a selective deposition process at all. The second conductive polysilicon layer is deposited on the pad nitride layer and within the trench. It can be seen in Fig. 1B that the pad nitride layer and the trenches make up the entire surface of the substrate.

There is no area of the illustrated substrate where the second conductive polysilicon layer does not deposit. Heo requires a CMP step to remove the second conductive polysilicon layer on the pad nitride layer and to partially remove the second conductive polysilicon layer in the trench. In Applicants' process, no CMP and no partial removing is required because the second conductive polysilicon layer does not deposit on the nitride layer nor on the crystalline silicon layer nor on any area other than "into said deep trench" as claimed in Claim 1, for example, lines 14-15.

In conclusion, Heo et al does not disclose a selective deposition process. Therefore, Applicants' claims of selective deposition are not anticipated by Heo et al.

Reconsideration of the rejection under 35 U.S.C. 102 of Claims 1 and 6 as being anticipated by Heo et al is requested in accordance with the remarks above.

Reconsideration of the rejection under 35 U.S.C. 103 of Claims 2-5 and 7-25 as being unpatentable over Heo et al is requested in accordance with the following remarks.

As discussed above, Heo et al does not disclose selective deposition of polysilicon. It is discussed on page 11 of the Specification that Applicants' process of selective polysilicon deposition deposits the buried strap to a controlled thickness that cannot be achieved by Heo's method of non-selective deposition and CMP. Applicants' invention avoids CMP as taught on pages 11 and 13. Heo does not teach or suggest the key selective deposition to form the buried strap of Applicants' invention.

Reconsideration of the rejection under 35 U.S.C. 103 of Claims 2-5 and 7-25 as being unpatentable over Heo et al is requested in accordance with the remarks above.

Allowance of all Claims is requested.

It is requested that should Examiner Chen not find that the Claims are now Allowable that the Examiner call the undersigned at 765 4530866 to overcome any problems preventing allowance.

Respectfully submitted,

A handwritten signature in cursive script, reading "Rosemary L. S. Pike".

Rosemary L. S. Pike. Reg # 39,332